

**Revenue Forecasting Methodology**

The University of Memphis forecasters independently prepare quarterly reports of revenue updates and forecasts for use in the internal decision-making done in the City of Memphis Finance Department. The forecasts have two areas of focus: forecasts for the current fiscal year's end-of-year revenues and forecasts for the next fiscal year and for each year out for ten years.

A team of Ph.D. economists report on current economic trends that influence the City of Memphis. National, state and local economic indicators receive full discussion in both an oral presentation and written documents. These perspectives are essential for the finance department to understand and respond to a second area of focus. In the second part of the quarterly report, the team prepares numerical forecasts for the current fiscal year's end-of-year revenues, for the next fiscal year, and for each year out for ten years. The forecasts are for more than fifty revenue variables, including total revenue for the city's general fund, subgroups of revenue sources, and individual revenue sources. The format of the forecast involves a median forecast as the single most likely value and a high/low range to indicate the degree of uncertainty. Also, for the most important single revenue sources and for total revenue, there is a more detailed risk analysis. This involves developing a downside risk assessment expressed as the probability that revenues will be at or below important levels.

The smallest revenue sources are forecasted with autoregressive, integrated, moving average models estimated with monthly or annual data that extends back to 1968 in some cases. Major revenue sources get forecasts from at least two alternative statistical models. For some variables, seasonal patterns are so reliable that end-of-year totals are accurately predicted from year-to-date data used in some of the quarterly updates. For longer-term forecasts, entirely different models are necessary. For some of the revenue sources, national and regional economic indicators are useful to add to short and long term forecast accuracy. These statistical models are combinations of autoregressive, integrated, moving average (ARIMA) modeling and regression analysis. Although some series are estimated with single equation models, others have simultaneous equation models. Stochastic simulations of the short- and long-term models generate empirical estimates of the probability distributions for the revenue sources. These distributions are reported both for the current fiscal year and the next fiscal year. These simulation results are used to report the high/low ranges for the revenue sources and the detailed risk analyses. The high/low range end points are defined to cover the middle 50 percent of the estimated distributions for the forecasted variables. They are, in fact, the first and third quartiles that surround the median forecast. These intervals are reported for detailed lists of revenue sources, for subcategories of the general fund, and for total revenue.

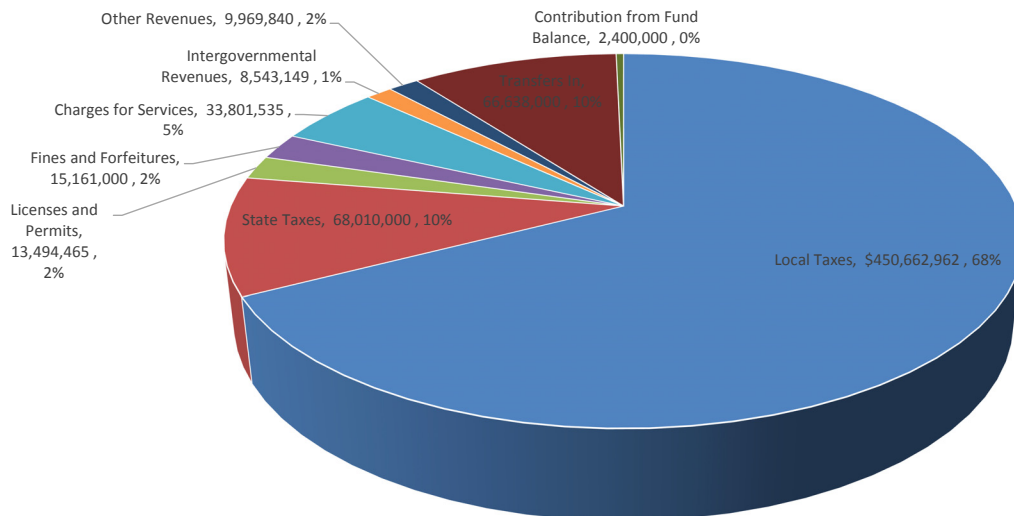
The simulation results are the basis for more detailed risk analysis of total revenue, the property tax, and the sales tax. These risk reports give the quartiles and median, plus all the deciles. For example, the first decile in the forecast distribution for total revenue is the level of revenue such that there is a 10 percent probability that revenue will be at or below that level. In addition, the risk analysis estimates the probability that revenues will be at or below key levels, such as the previous year's level and the level anticipated in the operating budget. This risk analysis is a downside risk description, giving the probability that end-of-year revenue will be short of specified values.

## GENERAL FUND

## GENERAL FUND REVENUES

Revenue Category	FY 2016 Actual	FY 2017 Adopted	FY 2017 Forecast	FY 2018 Request
Local Taxes	\$ 438,611,385	\$ 441,868,104	\$ 440,356,394	\$ 450,662,962
State Taxes	69,327,565	83,875,000	69,319,175	68,010,000
Licenses and Permits	13,171,978	12,488,033	12,904,957	13,494,465
Fines and Forfeitures	16,633,286	18,188,368	12,859,352	15,161,000
Charges for Services	34,755,006	33,468,639	31,756,666	33,801,535
Use of Money and Property	890,741	335,000	225,698	335,000
Federal Grants	523,985	-	697,654	300,000
State Grants	1,282,898	1,630,362	1,663,558	1,630,362
Intergovernmental Revenues	5,995,725	6,409,377	9,409,377	8,543,149
Other Revenues	10,712,436	7,162,116	9,189,774	7,704,478
Transfers In	59,357,333	62,000,000	65,643,964	66,638,000
Contribution from Fund Balance	-	-	-	2,400,000
<b>Total Revenues</b>	<b>\$ 651,262,338</b>	<b>\$ 667,424,999</b>	<b>\$ 654,026,569</b>	<b>\$ 668,680,951</b>

FY2018 General Fund Revenues by Category



# GENERAL FUND

# GENERAL FUND REVENUES

Revenue	FY 2016 Actual	FY 2017 Adopted	FY 2017 Forecast	FY 2018 Request
040110 Ad Valorem Tax - Current	245,330,515	249,470,000	246,975,300	250,500,000
040112 Ad Valorem Tax - Current Sale of Receivables	5,133,106	7,500,000	7,500,000	7,500,000
040120 Ad Valorem Tax Prior	4,455,109	5,200,000	3,900,000	5,200,000
040122 Ad Valorem Tax - Prior One Time Assessment	116,738	-	18,637	-
040160 Special Assessment Tax	709,046	558,000	589,000	558,000
040150 Property Taxes Interest & Penalty	5,180,516	4,200,000	4,200,000	4,200,000
040151 Bankruptcy Interest & Pen- alty	150,268	170,000	170,000	170,000
040152 Interest & Penalty - Sale of Tax Rec	1,452,038	1,300,000	1,300,000	1,500,000
040130 PILOT's	3,453,064	4,500,000	4,500,000	3,500,000
040810 State Appointment TVA	7,788,276	7,800,000	7,800,000	7,800,000
040210 Local Sales Tax	109,343,905	109,000,000	109,000,000	113,000,000
040211 Tourism Development Zone Local Sales	1,960,398	1,980,000	2,148,495	1,980,000
040311 Beer Sales Tax_040311	16,867,342	17,000,000	17,000,000	17,500,000
040310 Alcoholic Beverage Inspec- tion Fee	5,044,098	5,000,000	5,400,000	5,000,000
040710 Mixed Drink Tax_040710	7,618,348	6,400,000	6,700,000	7,400,000
040410 Gross Rec Business Tax	12,645,621	11,000,000	12,000,000	13,500,000
040720 Bank Excise Tax	979,595	954,000	954,000	954,000
040910 Franchise Tax - Telephone	2,130,995	1,800,000	2,150,000	2,200,000
040911 Cable TV Franchise Fees	4,266,525	4,300,000	4,300,000	4,300,000
040912 Fiber Optic Franchise Fees	619,409	894,842	950,000	950,000
040914 Misc Franchise Tax	844,556	840,000	875,000	850,000
040510 Interest, Penalties & Com- mission	465,030	200,000	200,000	200,000
040610 Business Tax Fees	1,278,316	1,000,000	1,000,000	1,100,000
043013 Warrants and Levies	-	300	-	-
043421 Misc Tax Recoveries	477,607	500,000	425,000	500,000
049158 MLGW/Williams Pipeline	300,962	300,962	300,962	300,962
FSC430 430 Local Taxes	\$438,611,385	\$441,868,104	\$440,356,394	\$450,662,962
041500 State Gas - Motor Fuel Tax	\$ -	\$ 11,000,000	\$ -	\$ -
041501 Three-Cent Tax	-	3,500,000	-	-
041502 One-Cent Tax	-	1,900,000	-	-



# GENERAL FUND

# GENERAL FUND REVENUES

Revenue	FY 2016 Actual	FY 2017 Adopted	FY 2017 Forecast	FY 2018 Request
041200 State Sales Tax	52,458,459	52,500,000	54,300,000	55,000,000
041210 Telecommunication Sales Tax	54,304	60,000	56,000	55,000
041100 State Income Tax	14,807,822	13,000,000	13,000,000	11,000,000
041300 State Shared Beer Tax	315,863	315,000	315,000	315,000
041400 Alcoholic Beverage Tax	382,012	300,000	340,000	340,000
043011 Spec Petroleum Product Tax	1,309,106	1,300,000	1,308,175	1,300,000
<b>FSC435 435 State Taxes</b>	<b>\$ 69,327,565</b>	<b>\$ 83,875,000</b>	<b>\$ 69,319,175</b>	<b>\$ 68,010,000</b>
042123 Auto Registration Fee	\$ 12,237,256	\$ 11,500,000	\$ 11,900,000	\$ 12,500,000
042124 Dog License	270,903	274,965	275,764	274,965
042125 County Dog License Fee	101,346	83,568	112,193	100,000
042111 Liquor By Ounce License	229,010	215,000	215,000	215,000
042112 Taxi Drivers License	18,009	20,500	18,000	20,500
042113 Gamin Pub Amus Perm Fee	17,683	15,000	15,000	15,000
042114 Wrecker Permit Fee	11,733	11,000	11,000	11,000
042116 Misc Permits	68,216	80,000	70,000	70,000
042122 Beer Application	45,658	60,000	70,000	60,000
043003 Beer Permit Privilege Tax	152,869	140,000	130,000	140,000
049101 Sidewalk Permit Fees	19,294	88,000	88,000	88,000
<b>FSC440 440 Licenses and Permits</b>	<b>\$ 13,171,978</b>	<b>\$ 12,488,033</b>	<b>\$ 12,904,957</b>	<b>\$ 13,494,465</b>
042210 Court Fees	\$5,702,684	\$5,600,000	\$4,699,633	\$5,000,000
042211 Court Costs	5,424,129	6,300,000	5,499,926	6,000,000
042221 Fines & Forfeitures	4,467,416	5,105,000	1,711,182	3,105,000
042222 Seizures	108,601	50,000	91,684	100,000
042224 Beer Board Fines	111,008	110,000	132,000	110,000
042230 Arrest Fees	184,680	215,000	170,000	215,000
042248 DUI BAC Fees	2,830	2,400	1,253	2,400
042249 Sex Offender Registry Fees	110,000	262,368	110,000	110,000
042225 Library Fines & Fees	440,187	425,000	413,824	400,000
042228 Delinquent Collection Fees	-	100,000	-	100,000
042229 Vacant Property Registration Fee	81,750	18,600	29,850	18,600
<b>FSC445 445 Fines and Forfeitures</b>	<b>\$ 16,633,286</b>	<b>\$ 18,188,368</b>	<b>\$ 12,859,352</b>	<b>\$ 15,161,000</b>



# GENERAL FUND

# GENERAL FUND REVENUES

Revenue	FY 2016 Actual	FY 2017 Adopted	FY 2017 Forecast	FY 2018 Request
043111 Subdivision Plan Inspection Fee	\$ 171,300	\$ 90,000	\$ 90,000	\$ 90,000
043612 Subdivision Development Fees	10,550	-	47	-
043501 Admissions - Museum Workshops	-	-	94	-
043502 Admissions - General	10,457	-	306	-
043503 Museum Planetarium Fee	-	-	188	-
043507 Parking	605,936	743,000	696,496	527,497
043508 Senior Citizen's Meals	95,859	82,000	75,000	75,000
043509 Concessions	2,147,891	1,500,382	1,423,415	2,149,152
043510 Golf Car Fees	1,047,958	1,057,500	817,461	1,149,500
043511 Pro Shop Sales	123,260	135,500	106,199	137,300
043513 Green Fees	1,438,764	1,565,100	1,150,507	1,702,996
043516 Softball	85,320	91,000	27,435	28,000
043518 Basketball	12,530	17,500	2,900	-
043519 Football	2,250	1,000	800	-
043521 Ball field Permit	20,792	18,000	18,000	18,000
043522 Class Fees	58,451	55,750	62,250	47,310
043523 Yearly Tennis	20,000	-	-	-
043653 Day Camp Fees	260,671	320,220	265,200	260,200
043654 Food Service Revenue	(1,741)	-	(425)	-
043670 After School Camp	2,110	3,000	2,100	2,100
043213 Parking Meters	917,076	850,000	850,000	850,000
043415 Ambulance Service	22,328,983	21,000,000	21,000,000	21,260,000
043524 Rental Fees	1,980,453	2,025,000	1,854,484	1,979,047
043526 MLG&W Rent	2,400	2,400	2,470	2,400
043527 Rent Of Land	128,611	43,130	42,713	31,738
043680 Parking Lots	315,000	315,000	315,000	315,000
049150 Easements & Encroachments	110,181	75,000	75,000	75,000
043012 Tax Sales Attorney Fees	617,190	525,000	525,000	525,000
043211 Street Cut Inspection Fee	267,088	250,000	250,000	250,000
043212 Traffic Signals	306,733	200,000	200,000	200,000
043215 Signs-Loading Zones	31,538	15,000	15,000	15,000
043216 Arc Lights	3,809	4,000	4,000	4,000
043217 Wrecker & Storage Charges	453,940	500,000	500,000	500,000
043412 Shelter Fees	225,311	181,239	235,673	200,000



# GENERAL FUND

# GENERAL FUND REVENUES

Revenue	FY 2016 Actual	FY 2017 Adopted	FY 2017 Forecast	FY 2018 Request
043413 Animal Vaccination	35,042	22,943	35,591	32,000
043617 Police Special Events	142,444	700,000	98,610	250,000
043714 Outside Revenue	-	78,500	4,351	125,295
043732 P & S Printing	16,684	-	10,800	-
043736 Tow Fees	760,165	1,000,000	1,000,000	1,000,000
043737 Officers in the Schools	-	1,475	-	-
FSC450 450 Charges for Services	\$ 34,755,006	\$ 33,468,639	\$ 31,756,666	\$ 33,801,535
045100 Interest on Investments	\$ 507,759	\$ 115,000	\$ 278,214	\$ 115,000
045102 Net Income/Investors	231,638	100,000	(103,443)	100,000
045210 State Litigation Tax Commission	151,344	120,000	50,927	120,000
FSC455 455 Use of Money and Property	\$ 890,741	\$ 335,000	\$ 225,698	\$ 335,000
046118 Federal Grants - Others	\$ 523,985	\$ -	\$ 697,654	\$ 300,000
FSC460 460 Federal Grants	\$ 523,985	\$ -	\$ 697,654	\$ 300,000
047010 St TN Highway Maint Grant	\$ 504,160	\$ 830,362	\$ 863,558	\$ 830,362
047011 St TN Interstate	778,738	800,000	800,000	800,000
FSC465 465 State Grants	\$1,282,898	\$1,630,362	\$1,663,558	\$1,630,362
048201 International Airport	\$3,501,525	\$3,409,377	\$3,409,377	\$3,543,149
048209 MHA	3,200	-	-	-
048210 MATA	2,491,000	3,000,000	6,000,000	5,000,000
FSC470 470 Intergovernmental Revenues	\$5,995,725	\$6,409,377	\$9,409,377	\$8,543,149
049111 Miscellaneous Auctions	\$1,594,053	\$1,600,000	\$1,600,000	\$1,600,000
049127 Sale Of Capital Assets	2,700	-	1,791,720	-
048100 Local Shared Revenue	618,854	1,966,856	1,902,473	1,482,056
043001 Anti-Neglect Enforcement Program	202,464	200,000	80,785	200,000
043116 Property Insurance Recoveries	351,423	229,939	403,554	374,221
043417 Rezoning Ordinance Publication Fees	4,650	10,000	4,600	10,000
043419 Sale Of Reports	378,191	273,423	276,036	285,423
048211 City of Bartlett	981,684	1,034,000	984,659	1,034,000



# GENERAL FUND

# GENERAL FUND REVENUES

Revenue	FY 2016 Actual	FY 2017 Adopted	FY 2017 Forecast	FY 2018 Request
048300 Utility Warranty Program	-	-	-	500,000
049100 Miscellaneous Income	617,109	389,500	458,431	736,030
049108 Sewer Fund Cost Allocation	1,075,000	1,075,000	1,075,000	1,075,000
049118 Court Reimbursement	-	-	47	-
049120 Unclaimed Property	20,291	-	14,562	-
049123 Fire - Misc Collections	69,278	20,000	36,462	20,000
049126 Cash Overage/Shortage	7,677	30	5,096	30
049129 Donated Revenue	67,488	-	55,501	15,000
049134 Coca - Cola Sponsorship	70,000	65,000	65,000	70,000
049139 Insurance Refund	-	-	-	-
049140 Vendor Rebates	69,123	-	79,603	-
049146 Grant Revenue - Library	47,208	17,000	31,989	17,000
049156 FNMA Service Fees	1,112	-	424	-
049157 Donations for Rape Kits	(5,000)	-	-	-
049166 Commissions	-	20,000	-	20,000
049623 Miscellaneous Revenue	260,564	61,368	117,449	59,868
049624 Misc. Library Revenue	3,104	-	-	-
049900 Recovery Of Prior Year Expense	4,275,464	200,000	200,023	200,000
049905 Mow to Own - Program Fees	-	-	5,850	5,850
FSC475 475 Other Revenues	\$ 10,712,437	\$7,162,116	\$9,189,264	\$7,704,478
040140 In Lieu Of Taxes-MLGW	\$ 52,282,027	\$ 55,200,000	\$ 58,768,964	\$ 58,700,000
040141 In Lieu Of Taxes-Sewer	5,588,675	5,000,000	5,000,000	5,500,000
070204 Oper Tfr In - Solid Waste Fund	75,000	-	-	-
070205 Oper Tfr In - Misc Grants Fund	7,981	-	-	-
070223 Oper Tfr In - Hotel/Motel Fund	28,651	-	-	38,000
070301 Oper Tfr In - Debt Service Fund	-	500,000	-	-
070601 Oper Tfr In - Sewer Operating/CIP	1,300,000	1,300,000	1,300,000	1,300,000
070661 Oper Tfr In - Metro Alarm	-	-	-	100,000
070671 Oper Tfr In - Storm Water	75,000	-	75,000	-
070731 Oper Trf In - Unemployment	-	-	-	1,000,000



**GENERAL FUND****GENERAL FUND REVENUES**

<b>Revenue</b>	<b>FY 2016 Actual</b>	<b>FY 2017 Adopted</b>	<b>FY 2017 Forecast</b>	<b>FY 2018 Request</b>
070804 Oper Tfr In - Beale Street	-	-	500,000	-
FSC480 480 Transfers In	\$ 59,357,333	\$ 62,000,000	\$ 65,643,964	\$ 66,638,000
045122 Interest Income - US Gov- ernment	\$ -	\$ -	\$ 508	\$ -
FSC580 580 Dividend and Interest on Investment	\$ -	\$ -	\$ 508	\$ -
049999 Contributed From Fund Balance	\$ -	\$ -	\$ -	\$2,400,000
FSC301 301 Contributed from Fund Balance	\$ -	\$ -	\$ -	\$2,400,000
Total Revenues	\$651,262,338	\$667,424,999	\$654,026,569	\$668,680,951